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JANUARY 14, 1950

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Television Tubes

See Page 30

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ONE A YEAR

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VOL. 57 NO. 2 PAGES 17-32



***Your telephone
uses ceramics, too!***

Five thousand years ago, potters were making household vessels of clay. As skill grew, grace of shape and ornament were added. The beauty of fine china has been recognized by every civilization, while the availability, ease of manufacture and durability of other ceramics have given them wide use.

Your telephone, too, uses ceramics. Behind its dial is a metal plate, glazed as carefully and in much the same manner as this fine piece of pottery. It carries the letters and numbers you dial, so it must resist both fading and abrasion. You will find other ceramics as insulators, supporting wires on pole lines; in eighty thousand miles of underground conduit, where fired clays defy decay and corrosion.

Today at Bell Telephone Laboratories scientists utilize ceramics in ways undreamed of in ancient times. Ceramic thermistors provide automatic controls for electric current, to offset temperature and voltage fluctuations. One kind of ceramic makes low-loss insulation at high frequencies. Another supplies controlled attenuation for microwaves in waveguides.

Each use demands a special composition, scientifically controlled and processed. Basic studies in the chemistry and physics of ceramics have shown how to utilize their versatile properties in electrical communication. And research continues on ceramic materials as well as on every other material which promises better and cheaper telephone service.



BELL TELEPHONE LABORATORIES
EXPLORING AND INVENTING, DEVISING AND PERFECTING, FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE.

PLANT PATHOLOGY

Clues to Cancer Puzzle

Temperature and time play major roles in starting normal cells on the way to abnormal growth. These and other findings of Braun are significant in the cancer fight.

➤ TUMOR-INDUCING bacteria need just the right temperature range and enough time to start normal cells on the way to abnormal growth, before the plant disease known as crown gall can get a toehold, said Dr. Armin C. Braun of the Rockefeller Institute for Medical Research in the paper that won him the annual \$1,000 prize at the recent meeting of the American Association for the Advancement of Science in New York.

Using the long-known but little understood fact that in certain plants tumors will not form at temperatures of 30 degrees Centigrade (86 degrees Fahrenheit) or above, Dr. Braun discovered that:

1. It takes slightly more than one day after inoculation with the bacteria for a tumor to begin to form.

2. If the inoculation wound is allowed to heal for four days at high temperatures to prevent tumor-formation, when the temperature is lowered the plant will be immune, even though the bacteria are present in abundance. No tumor will form unless another wound is made and the temperature is kept below 30 degrees Centigrade.

3. Tumor formation takes place in two stages. First, normal cells are transformed into tumor cells. Second, a growth principle which seems to involve hormones enables the abnormal cells to continue to develop unchecked.

4. As temperatures approached the critical point of 30 degrees Centigrade, tumor activity decreased until at 28.8 degrees Centigrade (83.3 F.) tumor formation ceased.

These findings are considered to be highly significant in the fight against human cancer. In awarding Dr. Braun the prize, the prize committee said that his experiments "chart a basic course in man's understanding of the greatest human malady." Dr. Braun pointed out that "the characteristics of these plant tumors are, as far as the affected cells are concerned, the same as those by which human malignant cells are distinguished from normal or inflammatory cells."

Crown gall, which is initiated by the rod-shaped bacillus *Agrobacterium tumefaciens*, occurs throughout the world and attacks many different kinds of crops, including orchard trees, sugar beets, and raspberries. However, Dr. Braun pointed out that his experiments were not directed at improved agricultural practices. He pursued them primarily in the search for insight into the problem of human cancer.

With the knowledge gained in his prize-winning research, Dr. Braun expects to

continue further investigations into plant tumors. The three main problems which lie ahead, he said, are the following:

1. To discover the character of the principle which causes normal cells to change into tumor cells.

PUBLIC HEALTH

Rider Fights Epidemics

➤ THE circuit rider, familiar sight in rural areas of the South around the turn of the century, is riding again. But while the circuit rider of 1900 was a preacher on horseback, the 1950 circuit rider is a public health worker in an automobile or jeep.

During the polio epidemic in Arkansas last summer, he made rounds three times a week to collect from field workers certain important specimens for laboratory study.

2. To determine the nature of the cell change itself.

3. To find a way to reverse the process, so that tumor cells can be transformed into normal cells.

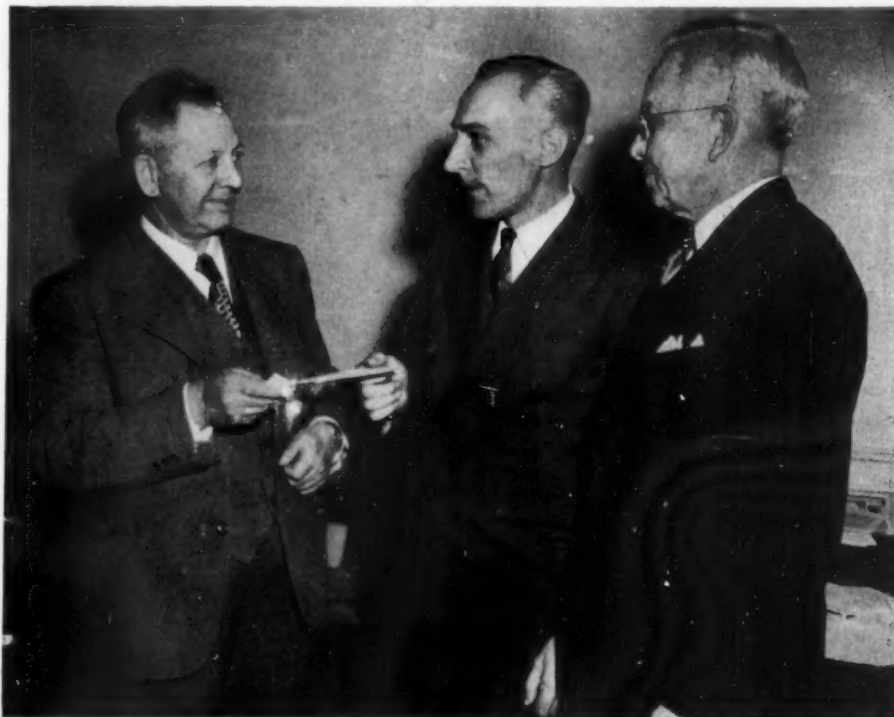
Dr. Braun is an associate in the Division of Plant Pathology at the Rockefeller Institute for Medical Research. He has been with the Institute since October, 1938, with three years out as a captain in the Army Sanitary Corps from 1943-46.

He was born Sept. 5, 1911, in Milwaukee, Wis. He took his Ph.D. degree at the University of Wisconsin in 1938. He is unmarried and lives in Princeton, N. J.

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The circuit rider is part of the set-up through which the U. S. Public Health Service's Communicable Disease Center, Atlanta, Ga., gives assistance to state health departments during epidemics or other disasters.

During 1949, such aid was given to 17 states. Floods predominated among the disasters. The most extensive investigation, however, was carried out in Muskegon, Mich., in August and September. A team



\$1,000 PRIZE WINNER—Dr. Armin C. Braun (center), Rockefeller Institute for Medical Research, receives the twenty-second AAAS \$1,000 prize award from Dr. Elvin C. Stakman, AAAS president, University of Minnesota, for his work with plant tumors. Dr. Kirtley F. Mather, Harvard University, AAAS president-elect, watches.

of 12 persons conducted there "one of the most thorough studies ever made of a community in connection with a poliomyelitis epidemic. Some phases of this research will continue for several years," Surgeon General Leonard A. Scheele stated.

"Public Health epidemiologists are the detectives of epidemic disease," Dr. Scheele pointed out. "One of the most mysterious cases they worked on last year was the baffling epidemic which afflicted human beings and horses at the same time last August and September in Weld and Morgan Counties, Colorado."

A physician-veterinarian team was sent from the Communicable Disease Center to investigate the outbreak. They found that two similar virus diseases existed simul-

taneously, creating a complicated diagnostic problem. Poliomyelitis was prevalent in human beings at the same time encephalitis afflicted both man and horses.

In this and other epidemic emergencies, the investigators gathered specimens which were sent by air express to the laboratories of the Communicable Disease Center, in San Francisco, Montgomery, Ala., or Savannah, Ga., for analysis.

After determining the cause of the outbreak, the Center aided the state and local health departments, when needed, in providing immunization, isolation and quarantine, sanitation, insect and rodent control, veterinary public health services, and emergency medical care.

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MEDICINE

Babies' Diarrhea Subdued

► HOPE that babies suffering from severe stomach and intestinal inflammation can be helped by chloromycetin, one of the new antibiotic drugs, appears in a report from Drs. K. B. Rogers, S. J. Koegler and John Gerrard of the Children's Hospital, Birmingham, to the *BRITISH MEDICAL JOURNAL* (Dec. 31) in London.

"Most encouraging" results followed use of this drug for babies suffering from the infectious infantile diarrhea which comes in epidemics. Sulfa drugs, penicillin and streptomycin had previously been tried in such cases and failed, the Birmingham doctors report.

In many cases a germ called *Bacterium coli* B. G. T. (Bray-Giles-Taylor) was present. Preliminary tests showed that all strains of this germ were sensitive to chloromycetin and also to aureomycin. The Birmingham doctors chose chloromycetin because "of its relative stability."

They are now trying the drug in all cases of severe infantile diarrhea, regardless

of whether *Bacterium coli* B. G. T. is present or not, since there is not proof anyway that this germ really is the cause of the disease.

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INVENTION

Machine to Take Place Of Corner Newsboy

► GOODBY to the newsboy on the corner—a coin-in-the-slot machine has been invented to take his place.

This mechanical newspaper vendor is one of the 730 inventions on which the government issued a patent recently. Its inventor is Stewart S. Blanc of San Francisco, and the patent number is 2,488,897.

In general appearances this vendor is much like others but it is of sufficient size to hold as big a pile of papers as needed. They are put in through a door with their center fold to the front. A specially de-

signed sliding drawer, released by the coin, can be pulled forward and then pushed back into place. The action operates a mechanism which drops a single paper to a lower section from which the customer may pick it up.

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RADIO

Saturday, January 21, 3:15 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Simon Klosky, chemist, Office of Synthetic Liquid Fuels, U. S. Bureau of Mines, Department of Interior, will talk on "Liquid Fuel from Oil Shale".

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Question Box

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MEDICINE

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What kind of attack on filariasis has recently proved successful? p. 22.

What kind of operation is now being used for victims of cystic fibrosis of the pancreas? p. 23.

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PUBLIC HEALTH

What is the mission of the modern circuit rider? p. 19.

GENERAL SCIENCE

Truman Science Angles

The President calls for productive utilization and conservation of natural sources. Health benefits, education for all and a science foundation bill are needed.

Excerpts from President Truman's State of the Union message to Congress, Jan. 4:

► IF we are to achieve a better life for all, the natural resources of the country must be regarded as a public trust. We must use our precious assets of soil, water, forest and grassland in such a way that they become constantly more productive and more valuable. Government investment in the conservation and development of our resources is necessary to the future economic expansion of the country.

We need to enlarge the production and transmission of public power. This is true not only in those regions which have already received great benefits from federal power projects, but also in regions such as New England where the benefits of large-scale public power development have not yet been experienced.

In our hydro-electric and irrigation undertakings, as well as in our other resource programs, we must continue policies to assure that their benefits will be spread among the many and not restricted to a favored few.

Important resource legislation which should be passed at this session includes the authorization of the St. Lawrence Seaway and power project and the establishment of the Columbia Valley Administration.

Through wise government policies and government expenditures for the conservation and development of our natural resources, we can be sure of transmitting to our children and our children's children a country far richer and more productive than the one we know today.

The value of our natural resources is constantly being increased by the progress of science. Research is finding new ways of using such natural assets as minerals, seawater, and plant life. In the peaceful development of atomic energy, particularly, we stand on the threshold of new wonders. The first experimental machines for producing useful power from atomic energy are now under construction. We have made only the first beginnings in this field, but in the perspective of history they may loom larger than the first airplane, or even the first tools that started man on the road to civilization.

National Science Foundation

To take full advantage of the increasing possibilities of nature, we must equip ourselves with increasing knowledge. Government has a responsibility to see that our

country maintains its position in the advance of science. As a step toward this end, the Congress should complete action on the measure to create a national science foundation.

Another duty of the government is to promote the economic security, the health and the education of its citizens. By so doing, we strengthen both our economy and the structure of our society. In a nation rich as ours, all citizens should be able to live in decency and health. . . .

Health for All

In the field of health, there are immense opportunities to extend to more of our people the benefits of the amazing advances in medical science. We have made a good beginning in expanding our hospitals, but we must go on to remedy the shortages of doctors, nurses and public health services, and to establish a system of medical insurance which will enable all

Americans to afford good medical care.

Strong Educational System

We must take immediate steps to strengthen our educational system. In many parts of our country, young people are being handicapped for life because of a poor education. The rapidly increasing number of children of school age, coupled with the shortage of qualified teachers, makes this problem more critical each year. I believe that the Congress should no longer delay in providing federal assistance to the states so that they can maintain adequate schools.

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PHYSIOLOGY

Less Alcohol Needed to Get Drunk at 18,000 Feet

► IT takes less alcohol to make a person drunk at 18,000 feet than at sea level. This was discovered in studies with staff members and students of Stanford University School of Medicine, San Francisco, Calif.

The findings, reported by Dr. Henry W. Newman of the medical school, seem to bear out the widespread belief among aviators that a dose of alcohol which is not intoxicating at sea level will produce symptoms of intoxication at high altitudes.

The lowering of the capacity to take al-



DOGGED PERSISTENCE—Donald Kerr, Montclair, N. J., a former fencer, boxer and track star, skates backward on his artificial leg at the meeting of the American Medical Association in Washington, D. C. A student at the Henry H. Kessler Institute for Rehabilitation, Donald says he learned to do this through "dogged persistence."

cohol and remain sober at high altitudes is apparently related to the reduced oxygen in the atmosphere at high altitudes. But since few commercial flights are made at 18,000 feet except with pressurized cabins, it seems unlikely that passengers in general would show symptoms of intoxication on quantities of alcohol that are not intoxicating to them at sea level.

Dr. Newman's studies were made by measuring the alcohol concentration in the blood and noting at what level the subjects'

performance with a pursuitmeter type of apparatus fell off. Tests were run when the subjects were breathing room air and then when they were breathing a gas mixture of 10% and 90% nitrogen through a face mask. This air mixture is equivalent to that which would be breathed at 18,000 feet although the subjects were not under decreased atmospheric pressure. The studies are reported in detail in the *QUARTERLY JOURNAL OF STUDIES ON ALCOHOL* (Dec.).

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MEDICINE

Filariasis Attack Succeeds

► **SUCCESS** with a mass chemical attack on the dangerous tropical disease, filariasis, is announced by Dr. R. I. Hewitt of Lederle Laboratories, Pearl River, N. Y.

The victory was achieved on the island of St. Croix, in the American Virgin Islands. The weapon used in this chemical war on disease was a piperazine drug called hetrazan.

Filariasis is caused by a kind of worm and is spread by mosquitoes. It affects hundreds of millions of persons throughout the tropical world, though it seldom causes an epidemic. Some of our fighting men in the South Pacific during World War II were attacked by it and thousands worried over it because of the elephantiasis which is a late result in untreated cases. Until recently, hardly any chemical tried against it succeeded as a remedy.

Tablets of hetrazan, which had given good results in preliminary trials, were distributed throughout St. Croix, with instructions to the inhabitants to take them three times a day for seven days. A survey had shown that about 16 out of every 100

persons on the island were infected with the disease.

Supervised treatment under the control of teachers was carried out in all schools. Children under school age were not supplied with the tablets. Over 10,000 individual treatment units were distributed or left at hospitals for further use, for a population of between 12,000 and 14,000. Not all the inhabitants took the drug, and probably many did not take the full course of three pills daily for a week.

A check on a sample of the population one year later showed only about seven per 100 were infected. This is a reduction of about 60% over the previous year. Of even greater significance, the number of baby, or embryonic, worms in the blood of those examined at the year's end were so few that mosquitoes could not become infected and thus the chances for the spread of the disease were stopped.

Dr. Hewitt reports the success in this mass chemical war in the British scientific journal, *NATURE* (Dec. 31).

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ASTRONOMY

New Star Twinkle Theory

► **THE** twinkle of the stars is really a twinkle in your eye.

British research upsets the long-accepted idea that the scintillation of the stars is due necessarily to the way that hot and cold air currents of the earth's atmosphere affect the light.

In experiments upon artificial "stars" consisting of near-by electric light bulbs, Drs. H. Hartridge and R. Weale of London's Institute of Ophthalmology found that the eye observing a star performs minute movements that give rise to the twinkling effect.

This is what happens in the eye: The image upon the eye's retina from a point of light is a bright dot surrounded by a number of bright and dark rings. When the pattern is bright a large number of the little rods and cones, that receive light and make seeing possible, are stimulated and

the source looks large and constant. When the source is less bright, only a few cones are stimulated, the eye is rolled around until the light falls variously on both the brightness-recording rods and the cones that pick up color changes. Thus intermediately bright sources seem to fluctuate in brightness and color. Faint light fails to affect sufficiently the receptors in the retina to bring about sufficient changes in what is seen as the eye rolls about. Thus very faint stars do not twinkle in a normal manner.

A light that twinkles obviously became steady when Drs. Hartridge and Weale observed it through a telescope. This corresponds to what astronomers have found. They attribute this finding to the telescope making the light more concentrated for the eye. Brighter lamps, that were steady to the naked eye, were made to twinkle when they were viewed through a telescope the

wrong way around. This dimmed the light and made it seem farther away.

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INVENTION

New Device Hauls Crab Traps Off-Shore

► **CRAB** traps and lobster pots are quickly hauled to off-shore stations, guided by an operator remaining on dry land, by means of an underwater crawling wave motor developed by a chemist with a hobby for mechanics.

It is the undertow, or backward flow of the waves which follows the breaking of the waves on the shore, that takes the device out to sea. It is not a floating affair. It crawls away from the shore on the bed of the ocean. The greatest distance it has crawled to date is some 800 feet.

In appearance, this wave motor looks like a pair of skis upturned at both ends. Pivoted to the skis is an upward projecting plate with rockers on its lower side. The motor is directed in its outward trip by an attached line, one end of which is held on the shore by the user. By walking to the right or the left, he can direct the motor to the position wanted.

The inventor of this device is John Finn, consulting chemist of San Francisco. For it, he was recently awarded U. S. patent 2,487,229. He states that it can be used to carry a fishline from the shore to beyond the breakers, and also that it could drag a mine in times of war to an off-shore position.

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Words in Science— EVAPORATION-SUBLIMATION

► **THE** average speed of movement of the molecules is in proportion to their temperature. But some molecules will always have a higher speed than others. Some of the faster molecules that happen to be near the surface of the liquid and moving upward, will shoot through the surface so violently that the molecular attractions of the other molecules are not enough to hold them back. They escape as vapor.

Since evaporation occurs only at the surface, evaporation is faster when the surface is large. Speed of evaporation also depends on pressure on the liquid as well as on the temperature and extent of the surface.

Sometimes solids pass directly from the solid state to vapor without melting and passing through the liquid state. This process is called sublimation. Snow will sometimes evaporate without melting on a cold day. Dry ice, used in packing ice cream, is a material that sublimates at atmospheric pressure. It stays dry without melting until it is completely evaporated.

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MEDICINE

Operation Saves Babies

A nerve-cutting operation is saving the lives of babies who have a fatal pancreas condition. The operation involves a death risk of one out of five.

► A NEW nerve-cutting operation which promises to save babies and small children from an always fatal disease of the pancreas is announced by a New Orleans surgical-pediatrics team in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (Jan. 7).

The disease is relatively rare, but is found in two to three out of every 100 babies and children examined after death. It sometimes runs in families. Two-thirds of the victims are little girls.

Babies with this condition, called cystic fibrosis of the pancreas, fail to gain weight even though they have a good appetite. They cannot digest fat and do not absorb vitamin A well. Besides being undernourished and having digestive difficulties, they are very susceptible to colds. About a third of them get pneumonia followed by the serious lung disease, bronchiectasis.

With special diets and care to protect them against colds and other infections, their lives can be prolonged, but all eventually die. The longest any of these children has lived, according to one authority, is about 15 years.

"Spectacular immediate" improvement in both the lung and digestive conditions for four children following the new operation are reported by Drs. William B. Ayers, Daniel Stowens and Alton Ochsner of Tulane University School of Medicine and

the Ochsner Clinic.

A fifth child died of heart failure during the operation. Although showing that the operation is not without danger, the doctors pointed out that a risk of one death in five does not seem "prohibitive" compared with an eventual 100% mortality in unoperated patients.

The operation consists in first blocking the splanchnic nerves to the pancreas by injecting them with the local anesthetic, procaine. About a week to 10 days later, the nerves are cut completely.

Why a disease of the pancreas should lead to lung as well as stomach and intestinal disorders has been something of a mystery. The rapid improvement, sometimes within eight hours after the nerve block, of the cough and other lung symptoms suggested a new theory to the New Orleans doctors. This is that the diseased pancreas acts as a source of nerve impulses of abnormal degree to spinal and brain centers. These in turn discharge impulses of abnormal degree to all the internal organs. Cutting nerve connections to the pancreas interrupts the reflex arc which has been functioning in an abnormal way. The organs that were disturbed by their reflex connections with the pancreas get back to normal conditions again.

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told Dr. Odell. In 1941 some were on display in a show window in Juneau, Mr. Field said, where they confused "the Juneau populace who have considered the ice-worm story a hoax since the postcard was made showing macaroni in the ice labelled as glacier-worms."

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METEOROLOGY

Tornadoes May Soon Be Accurately Forecast

► TORNADOES may soon be accurately forecast.

Advance warning for threatened areas is promised from recent experiments by Dr. H. L. Jones, of Oklahoma Agriculture and Mechanical College.

Dr. Jones and his assistants succeeded in measuring lightning with an electronic yardstick. They hope from these measurements to be able to predict tornadoes.

"Our theory is really quite simple," Dr. Jones said. "It works something like this—if the bolts of lightning reach a certain unusual size, that suggests a tornadic storm is in the offing." If Dr. Jones' theory is correct, people living in central, southern, or southwestern areas of the United States, where tornadoes are more likely to occur, will be warned that a twister is coming, thus saving many lives.

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ZOOLOGY

Ice-Worms Are Real

► ICE-WORMS really do exist. Doubting Thomases who have thought they were merely a figment of some jokester's imagination now have assurances that these strange worms are real in a report from Dr. N. E. Odell of the University of British Columbia.

Dr. Odell saw them about 6,000 feet up on the Seward ice-field in the St. Elias Range, Yukon-Alaska boundary. They are mostly three-fourths of an inch long and black in color. They quickly dry up and die at ordinary air temperature when taken from the snow or melt water.

These were the first ice-worms Dr. Odell had ever seen, though he has travelled over glaciers and snowfields in various parts of the world for more than 30 years.

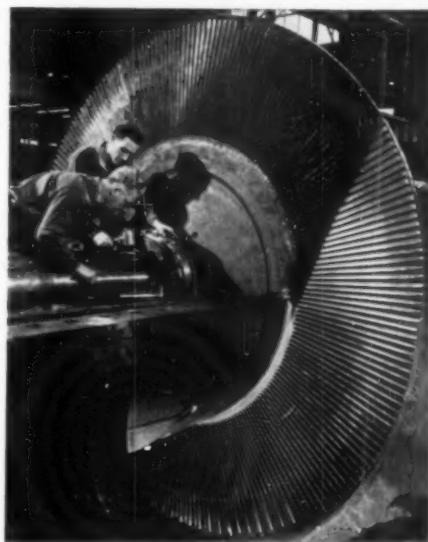
"There has been a good deal of mystery, and a lot of contention, over the subject of ice- or glacier-worms," he states in his report to the scientific journal, *NATURE* (Dec.

24). "It appears that their occurrence ranges from Alaska to as far south as California at least, and they are practically confined to the Pacific slope."

The worms Dr. Odell saw seemed to be migrating from one of a group of small glacial lakes to another, possibly making their way to some local areas of pink snow, there to feed on the algae. The worms themselves may in turn become food for a small waterbird, identified as a phalarope, which Dr. Odell saw swimming about and running over the floating ice as if feeding on the ice-worms.

From Dr. Paul S. Welch of the University of Michigan, Dr. Odell learned that there are at least 60 species and varieties of the genus *Mesenchytreus* to which the ice-worms belong.

Ice-worms are "not too uncommon on the Alaskan glaciers," W. O. Field of the American Geographical Society, New York,



ELECTRICITY FOR 300,000—A modern General Electric turbine, 12 times more powerful than the first of the "big" turbines, is shown under construction in Schenectady. With improved design and increased size, a single modern turbine may provide enough electricity to supply the normal electrical requirements of a city of 300,000 people.

MEDICINE

Whiffs of Chemical Deadens Pain of Doctor's Needle

➤ **HAVING** a needle stuck in a vein to draw blood or give medicine, having burns dressed and cuts sewed will be easier for Junior and his doctor in future, if the doctor follows a procedure worked out by three physicians in Dundee, Scotland.

The procedure is to give Junior and other small children a few whiffs of trichloroethylene before going on to the painful and frightening procedure. Although this is an anesthetic drug, using it with a simple draw-over type inhaler makes it possible to give such a low concentration that the drug acts only to deaden pain without putting the small patient to sleep. He may be drowsy but is awake enough to follow directions to turn over, or to lie still, or whatever may be necessary.

Good results in 98% of 60 consecutive cases are reported by Drs. J. Thomson, D. A. I. Grewar and J. G. Grounds, of the Royal Infirmary, Dundee, in the *BRITISH MEDICAL JOURNAL* (Dec. 24).

No bad after effects, even in acutely sick children, occurred. The drug can be given right after a meal, if necessary in emergencies. Only one of the 60 children vomited after it.

Letting the child inhale the pain-deadening drug is better, the doctors point out, than giving an injection of a pain-killer because this injection requires a needle prick which sometimes hurts and frightens the child so that he strenuously resists further treatments.

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ENGINEERING

Printers Locate Static With Red-Blue Powder

➤ **PRINTERS** can now sprinkle a new powder on sheets of paper to spot the troublesome static electricity that makes the paper running off the presses stick together.

A duplex red-blue powder, developed by Harry H. Hull of R. R. Donnelley and Sons Company in Chicago, Ill., tells where the positive areas and negative electrical charges are located. Red spots the positive areas and blue the negative.

Using this special powder, printers can now tell the best place to put the grounded Christmas tree tinsel they often use to neutralize static. Or they can use the powder to judge how efficient one kind of static eliminator is compared with another.

Not only the presses, but also the machines that fold paper generate electricity. Mr. Hull has found that paper from either presses or folding machines often have both positive and negative charges quite close together on the same sheet.

The special powder is a mixture of red

and blue powders. The blue is dyed lycopodium powder, spores of the plant that is widely used to make Christmas wreaths. The red dye, carmine, is mixed with sulfur to make the part of the powder that is attracted to the positive areas.

Many drugstores carry both lycopodium and carmine. When a glass rod is used to write upon cellophane, and the cellophane dusted with the powder, the writing outline is blue. Other parts of the cellophane attract the red part of the powder. Mr. Hull believes that this is due to friction with the writing surface.

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ZOOLOGY

New Suits for Newts With Sound Waves

➤ **THERE** is a new way to skin a newt. Very high frequency sound waves will make the little amphibian shed skin like an onion.

When left to its own schedule, a newt will molt about three times every two months. But when the little creature is placed in a bottle, and subjected to ultrasonic vibrations for eight to 120 seconds, its shedding rate jumps to a maximum of 7.6 newt-suits per 30 days.

Unlike most of the known ways for skinning cats, the sound wave treatment is not fatal to newts if the energy level is kept within limits, Dr. Hugh Clark of the University of Connecticut has found.

Above 35 watts of energy the dose is fatal, but below this level newts can be sound-vibrated indefinitely without any other observed effect except a rapid sequence of new coats.

Some other conclusions noted by Dr. Clark are:

1. One ultrasonic jolt of 30 watts for one to two minutes keeps a newt on the rapid molt routine for at least 70 days.

2. The vibrations seem to act on the epidermis but no skin effects were noted.

3. Although treatment seems to stimulate the thyroid gland directly, the pituitary gland shows no abnormal activity.

Science News Letter, January 14, 1950

GENERAL SCIENCE

Metal Hair Curlers May Cause Bald Spots

➤ **GIRLS**, loosen those braids and go easy with the metal hair curlers if you don't want to get bald spots above the ears.

This warning comes from Dr. Samuel Ayres, Jr., Dr. Samuel Ayres III, and Dr. Joseph I. Mirovich of Los Angeles in a report to the *ARCHIVES OF DERMATOLOGY AND SYPHILOLOGY* (Dec.), professional journal on skin diseases published by the American Medical Association.

Science News Letter, January 14, 1950

IN SCIENCE

MEDICINE

Wonder-Drug Cortisone Heals Scaly-Skin Disease

➤ **A SKIN** disease known as lupus erythematosus, heretofore considered incurable, has apparently been cured in a woman patient at the Wisconsin General Hospital in Madison, Wis., by the use of cortisone, a new adrenal gland hormone that has been beneficial in treating arthritis.

Generally marked by scaly eruptions on the face and especially near the nose, the ailment is difficult to diagnose in its earliest stages. The condition becomes chronic and generally stays with the patient the rest of his life because treatment has been difficult. It is fatal if it becomes deep seated, but such instances are rare.

In the Madison case, cortisone was used because the skin disease is one of the collagen diseases, related to rheumatoid arthritis. In these ailments, the structural framework of tissues, bone or cartilage breaks down.

University of Wisconsin doctors treated the woman for a month, using \$1,200 worth of cortisone at \$200 a gram. Money given by the U. S. Public Health Service for research paid for the drug.

Several departments at the Madison hospital collaborated in the treatment. When the patient was discharged, she was advised to return if the condition reoccurred, but she had not come back at the end of a month's time.

The supply of cortisone is still available only in small amounts for research.

Science News Letter, January 14, 1950

INVENTION

Magnetic Nail Holder To Save Fingers

➤ **SAFETY** for the fingers of the amateur carpenter when the hammer hits the head of the nail a little off-center will soon be available. It will come with a magnetic nail-holder on which the inventor was awarded a patent by the government.

It is a sort of thimble to slip over the index finger which has a permanent magnet on its outer end. Cut across the magnet is a slot to help hold the nail. The magnet is strong enough to pick up a nail and to hold it in place under the hammer. A glancing blow might injure the thimble, but the finger is relatively safe.

Robert P. Ingraham, San Antonio, Texas, is the inventor. Patent 2,491,860 was awarded to him. He claims that it is a handy device to use when trying to drive a nail in a hard-to-get-at place.

Science News Letter, January 14, 1950

ENE FIELDS

DENTISTRY

Rest, Diet Advised To Check Tooth Decay

► REST was suggested as a weapon against tooth decay in a report by Dr. Frances Krasnow and Miss Nina Budzinsky of the Guggenheim Dental Clinic to the American Association for the Advancement of Science.

A clue to impending tooth decay, they reported, may be found in the amount of protein present in the saliva. This also, they said, serves as "an index of derangement in health."

Diet as well as rest is included in the anti-tooth decay measures they advise. The diet is based partly on the saliva protein content and partly on a history of the patient's diet for the past week plus what he expects to eat during the coming week.

In some cases of high salivary protein they find, contrary to what the layman might suppose, that the patients had been getting too many minerals from eating too many fruits and vegetables.

As one example of their anti-tooth decay routine, they cited the case of a five-year-old child referred to them by the dentist as having "questionable caries." By this the dentist meant there were places on the child's teeth where the probe caught, and the enamel seemed to be getting thin.

Tests showed the child's salivary protein was 629 milligrams per 100 milliliters, when normal is about 298. At the end of 21 months on the rest and individually prescribed diet regime, his saliva protein was down to 299. Caries did not develop, although the child had no dental treatment.

An afternoon nap plus 12 hours of sleep at night made up the rest prescription for this child. For adults, the recommendation is usually eight hours of sleep every night and "take it easy on week-ends."

Science News Letter, January 14, 1950

ZOOLOGY

Horse-Like Animal Evolved Independently

► AN EXTINCT South American horse-like animal that looked like the horse we know today, yet was produced by independent evolution, is a striking example of nature's experiments in evolution on a vast scale.

Dr. George Gaylord Simpson of the American Museum of Natural History presented his theories concerning the evolution of South American animals to the University of Notre Dame Club of the Society of Sigma Xi, national society for

the encouragement of scientific research.

Dr. Simpson suggested that animals migrated to South America before the land bridge between the two continents had been submerged. When the continent became isolated, the animals evolved either as unique specimens or as types very similar to those of other continents. As an example of the latter he noted the litoptern, a hoofed animal very similar to the horse.

When the land bridge between North and South America was established again, the South American animals that were similar to North American ones became extinct. Types of animals that were unique to South America, however, generally survived, Dr. Simpson stated.

Science News Letter, January 14, 1950

GENERAL SCIENCE

Scientists Will Rebel at FBI Clearances

► IF Congress should require FBI clearance for all those who receive government scholarships, fellowships or research grants under the National Science Foundation bill now before Congress, some scientists will prefer not to see this proposed federal science body created.

Many scientists attending the American Association for the Advancement of Science are not enthusiastic about Congress requiring even nonsubversive affidavits from scientists, but they will rebel definitely over FBI clearances, just as the National Academy of Sciences did in connection with Atomic Energy Commission fellowships.

The Intersociety Committee on the National Science Foundation voted to swallow the proposed rider requiring affidavits, but it also patted the National Academy of Sciences on the back for its stand on AEC fellowships.

Science News Letter, January 14, 1950

HORTICULTURE

Bailey Postpones Trip Due to Broken Leg

► NINETY-one-year-old Dr. Liberty Hyde Bailey, famed horticulturist, will not be able to spend his 92nd birthday in the African jungle, but he is fully determined to celebrate his 93rd there. Dr. Bailey, who broke his leg in a fall while attending the American Association for the Advancement of Science meeting, has had to postpone an expedition to Africa to search for new plants scheduled to start Jan. 12.

According to members of his family, Dr. Bailey will be in the hospital for a few weeks and will have to keep his weight off his leg for six to nine months more. The world's greatest authority on palm trees, garden plants and blackberry bushes spent his 90th birthday alone on an island in the Caribbean and his 89th far up the Amazon River in Brazil.

Science News Letter, January 14, 1950

ENTOMOLOGY

Effect of DDT Now Lasts Longer

► MAKING DDT more deadly for a longer time in the fight against the pesky mosquito was promised in a report to the British journal, NATURE.

S. K. Ranganathan, T. Koshi and N. L. Sitaraman of the Establishment Laboratory, Kanpur, India, have found that the addition of a small amount of beta-methyl anthraquinone makes DDT more potent. The chemical is one of the compounds found in Burma teak.

They made their studies of it after finding that glass plates treated with DDT were more potent killers when stored previous to use in a box of Burma teak. The chemical alone, however, has no death-effect on mosquitoes.

Science News Letter, January 14, 1950

AGRICULTURE

Best Bulls in Industry, Cows Mated Via Heir-Mail

► THIS year for the first time in 30 years the federal cows out at the Beltsville, Md., experiment farm were bred by artificial instead of natural means. The reason: All the prize bulls that normally would be in federal service have been lured to the greener pastures of private dairy industry.

To service the Beltsville cows, semen is procured from artificial-breeding studs in Pennsylvania and New York, Dr. O. E. Reed disclosed in his annual report as chief of the Bureau of Animal Industry.

So keen is the competition for production-proved sires, that private organizations are buying up all the best bulls. In some cases, Dr. Reed said, artificial insemination groups take options on promising young bulls even before they have been fully tested. However, no deterioration of the government's demonstration herd is anticipated, since only selected proved sires are used in the current artificial insemination program.

Since the Bureau was created 25 years ago by Congress, Dr. Reed pointed out, the country's milk production has risen 29% whereas the number of cows has increased only 7%. He attributed this to improved breeding, feeding, and management methods which government scientists have led in developing.

Among the current research which holds promise of future gains, he listed mammary gland studies which make it possible to predict young heifer calves' future milk production, and a nutrition study which shows that large savings can be made by feeding more roughage and less milk and grain to young heifers.

Science News Letter, January 14, 1950

MATHEMATICS-ENGINEERING

How Giant 'Brains' Work

The giant computers solve complicated mathematical jobs with great rapidity and are also solving many scientific and industrial problems.

By CALVIN N. MOOERS

► MACHINES can remember—follow directions—work a typewriter by themselves—and do the most complicated mathematical problems in the wink of an eye. A half-dozen such giant machines right now are solving scientific and industrial problems in this country and abroad.

These machines are the new electronic digital computing machines, containing thousands of radio tubes, relays, and miles of wire. They are so complex in construction that they have been called "mechanical brains," "thinking machines," or even "super brains."

Helped with Atom Bomb

One of these machines helped solve some of the problems of the atom bomb and has worked on bomb-sight computations. Another is now helping to design airplanes for supersonic flight. Besides the machines now already built and operating, many more are still under construction in laboratories.

To call the new high speed digital computing machines "super brains" is very misleading. The machines are really quite stupid. Their ability stops at grade-school arithmetic. They can add, subtract, multiply, and divide any two numbers to get the answer. They do so with stupendous rapidity, and they can do these operations on different numbers hundreds of times and in any succession in a single second.

But simple algebra, as is taught to junior-high school students, is far too complicated for the machine to understand without help. Algebra has to be explained to the machine, step-by-step, in terms of directions to add this, divide by that, multiply by the result, and so on until the answer comes out.

Borrowed Brains

The list of directions is known as the "program," which must be worked out in advance before the machine can begin to operate. Given the right program—the borrowed brains of the human mathematician—the calculating machine is then able to do the most complicated problems of mathematics.

Just as the human body has its different organs to perform the different operations necessary for life, so does the electronic calculating machine have its different "or-

gans" necessary for carrying out its computations.

Has "Input" Organs

Corresponding to eyes and ears, which are our sensory "input organs" by which we learn what is going on around us, the computing machine has a teletypewriter keyboard for its input organ. On this keyboard the human operator types in all the information and directions—the program—that the machine will use in the solution of a problem. The program is in a simple code that the machine can understand and use. In this way the machine gets all the directions it will need to get to the very end of the problem.

Electric Nerves

Wire connections, aided by electronic amplifying tubes, act as the nervous system of the computing machine. Over these wire circuits, which operate just like high-speed telegraph lines, all information, whether

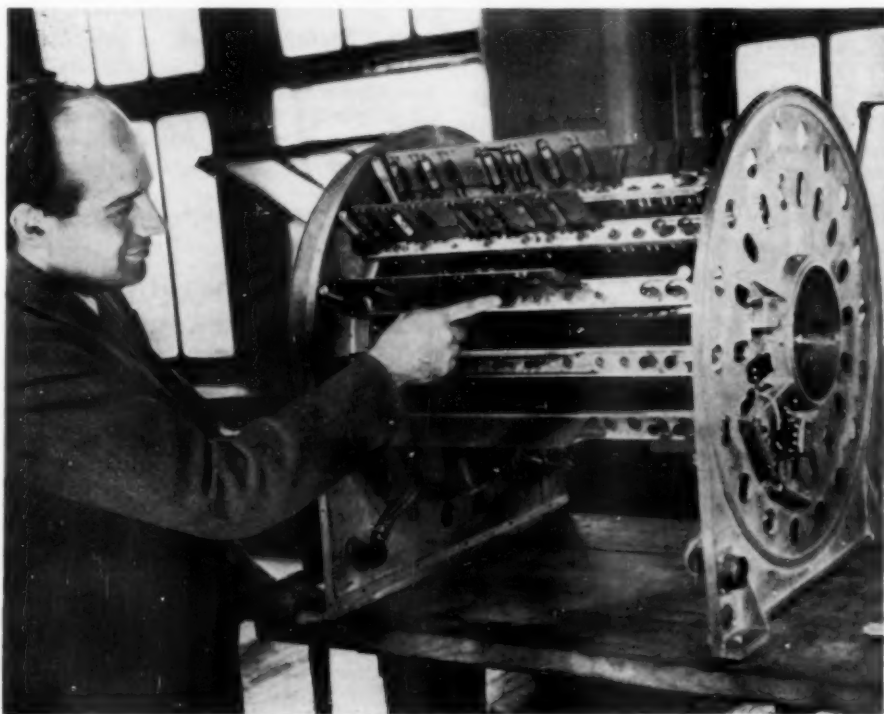
long strings of numbers, or the directions for the next operation, are signalled from one organ to another.

Each message sent over the machine's electronic nerves is only one "word" long, in the language of the computing machine experts. The words are of two kinds. It may be a "number" such as 133,675,022,123 which is twelve digits long and which would actually be used in some arithmetic computation.

On the other hand, the word might be an "order." Then it is one of the directions for operation, which, when put with many other such orders in a long list, makes up the program for the solution to the problem. An order might look like ADD 021; 022; 025. Of course this is an order to perform an addition, but it means a little more too, since surely 21 plus 22 never equalled 25.

Memory Most Important

The most important, and the most unusual, organ of a computing machine is its "memory" organ. With it the machine can remember or store for later use hundreds or thousands of separate words. It is partly because the machines can remember that people like to call the machines "brains."



UNDER CONSTRUCTION—J. Presper Eckert, Jr., of the Eckert-Mauchly Computer Corporation, points to one of the electronic amplifying strips of the memory unit in the process of construction for the BINAC. The unit has a hollow core that will be filled with mercury.



IN ACTION—The BINAC electronic computer in operation shows all the major operating organs. The girl's right hand is resting on the keyboard which is the input organ for the machine, and the results of the computations are typed out by the machine with the typewriter in front of her.

However, fortunately for us, there is more ability in our brains than that.

The memory organ is the first thing that is built in a computing machine. The rest of the machine is literally designed and built around the memory.

By far the most interesting memory systems are the "dynamic" or active memories of such computers as the BINAC, constructed by the Eckert-Mauchly Computer Corporation of Philadelphia, Pa., for Northrop Aircraft, Inc., and the Harvard Mark III recently completed for the Navy.

Railroad Car Loading

Imagine a circular railroad track, a loading platform at one side of the circle, and a freight train of about thirty box cars being pulled continuously around the track. If you want to get the contents of box car number 21, you wait until this car is opposite the loading platform and then you pull its load off when it is going by. If you hurry, and have another load ready for car 21, you can quickly shove it aboard before the car has passed the end of the platform. Otherwise, you will have to wait until the car comes by again, the next time around, and a little later.

Computing machines use electronic methods instead of railroad box cars and loading platforms. Otherwise the "dynamic" memory organ works in exactly this fashion.

In the Harvard Mark III machine there is a rapidly-rotating drum, magnetically coated on the outer surface. A timing "clock" marks out the numbers and spaces around the drum. Each space can hold one word. Like the numbers painted on the box cars, each space has a clock

number for its "address." By watching the timing clock, you can tell when a particular address is going by.

A magnetic recording head then records the dots and dashes of each word onto the different address positions of the magnetic drum. There the word stays as the drum whirls round and round, while other words may be written into other addresses, or while the computing machine is waiting until it needs the word from this address.

When this word is needed, the clock is watched. When the clock shows that the right address should be coming by under the magnetic pick-up head, the magnetic signals of the word are picked off the drum, just as in a magnetic tape recording outfit.

Mercury Memory

In the BINAC machine, an ingenious system of sound waves in a mercury tube is used for the dynamic storage system. It is another form of the drum principle, and in fact was developed first. In the mercury "delay line" memory system, the dots and dashes of a word are converted from an electric signal of the wire into an acoustic signal or a sound wave in the mercury inside a yard-long tube. The sound is set up right in the liquid mercury. The sound wave for each word starts at one end of the tube and moves along down to the far end of the tube. Like an echo, it takes a little while for the sound to get to the far end. When it arrives, the word is picked up by a microphone at the far end.

Unused Word Is Tricked

If the word is not needed at just the time it comes out of the mercury—and this is the usual situation—then a trick is used. The word is greatly amplified and sent right back again into the front end of the mercury delay tube, and into the same address position it occupied before. This may be done over and over again, and the word remains waiting in the same address for a week or a year.

As long as the word is not needed, it goes round and round, coming out of the mercury every thousandth of a second to be amplified, to have its dots and dashes squared up to look like new, and to go back into the memory again.

Many words can be stored in each mercury delay line since the line is many times the length of a single word.

How the Machine Computes

Computation is done in the "arithmetic organ" of the machine. Two different number-words are combined to give a numerical result. The way in which the numbers are to be combined is specified by an order-word.

The order ADD 021; 022; 025 is an abbreviation for these directions to the computing machine: Go to address numbered 021 in the memory and read out the number found there and put it into the arith-

metic organ. Go to address numbered 022 in the memory and read out the number found there and put it also in the arithmetic organ. There are now two numbers such as 005,600,000,000 and 001,401,000,229 in the arithmetic organ. The order then instructs the machine to add these two numbers together and to put their sum, which is 007,001,000,229, back into the memory at the address number 025.

The machine now drops this order-word and goes on to pick up the next order-word in the list of orders in the memory. The machine performs this order, and so on, at the rate of several thousand computations each second. It continues until the list of orders is used up and the whole computation is finished. The final answer is typed out by the machine in an "output organ" typewriter, and the machine stops. Its job is done.

Large-Scale Machines Operating

Bell Relay Computer. Built by Bell Telephone Laboratories during the war for the Army, now at Aberdeen, Md.

IBM Automatic Sequence Controlled Calculator—the Harvard Mark I. Built by Dr. H. H. Aiken of Harvard and IBM laboratory staff, and presented to the Harvard Computation Laboratory.

ENIAC Electronic and Numerical Integrator and Computer. Built by J. P. Eckert and Dr. J. W. Mauchly at the University of Pennsylvania and now at the Aberdeen Proving Ground.

Mark II. Built at the Harvard Computation Laboratory by Dr. H. H. Aiken and collaborators for the Navy, and now at the Naval Proving Ground, Va.

IBM Selective Sequence Electronic Calculator. Built in the International Business Machines Laboratory, and now in their New York office.

Mark III. Built at the Harvard Computation Laboratory for the Naval Proving Ground, Va.

BINAC. Built by the Eckert-Mauchly Computer Corporation for Northrop Aircraft Corp.

EDSAC. A British computer which is in partial operation at University of Manchester.

Bell Mark VI. Built at the Bell Telephone Laboratories and used on their own problems.

Science News Letter, January 14, 1950

MEDICINE

Conquest of Top Diseases In Near Future Is Seen

► CONQUEST, "in the comparatively near future," of cancer, infantile paralysis, arthritis, degenerative diseases such as hardening of the arteries and some diseases of the central nervous system is foreseen by the editor of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Jan. 7).

Events that "certainly will occur in the next 50 years," he declared, will probably overshadow such triumphs of the last century as the discoveries of insulin for diabetes, sulfa drugs, penicillin and other antibiotics for control of serious germ-caused sickness, vitamins, "blue-baby" and other life-saving operations.

Science News Letter, January 14, 1950

CONSERVATION

Soil Laws Need Change

► **CHANGES** in some of the laws that rule what people can and can not do with their land are needed if we really are to win in our fight to conserve the land of this country.

The reasons that we have not made the progress we could and should in our soil conservation program were outlined at the American Association for the Advancement of Science meeting by Prof. H. W. Hannah of the University of Illinois.

The laws that govern our soil conservation practices are the product of a time when land was simply another item for sale, barter, use and speculation. In spite of their long standing, however, Prof. Hannah believes that they are not necessarily the only democratic way to handle the problem.

If the government had kept the control it needed, over certain water rights, for instance, at the time the land was sold, there might not be the need today for soil conservation practices.

"In lieu of this retained control we have witnessed the spectacle of the federal government attempting to buy soil conservation from any farmer who will voluntarily make

the assumed sacrifice, using as a yardstick no better guide than acres taken out of depleting crops or evidence that some limestone was spread or a terrace constructed," Prof. Hannah stated.

In spite of the fact that great progress is being made in educating people to the need for soil conservation, the focal point in the next few years in the fight to save our basic resources should be for changing the laws, he concluded.

Science News Letter, January 14, 1950

PSYCHOLOGY

Problem Children Rank Low in Social Adjustment

► **CHILDREN** who receive teacher's approval get better grades, show higher IQ's, and are better adjusted socially, than the children who are in her bad graces, a psychology professor told the annual meeting of the American Association for the Advancement of Science.

Personality tests and a self-appraisal in-

ventory were used to gauge degrees of adjustment and approval, said Dr. George G. Thompson of Syracuse University. Four sixth-grade classes totalling 115 metropolitan public school children were selected for the study.

Analysis showed that those children who received the most blame from their teachers average as much as 18 points lower in the mental intelligence (IQ) scale, and they got lower grades than their more favored classmates.

This same group of "most-blamed" children ranked lowest in "social acceptability" among their fellows. They also showed the poorest personality adjustment to emotional problems.

Dr. Thompson suggested, somewhat cautiously, that much blame attaches to thoughtless teachers: "Although we do not wish to imply that teacher disapproval is the causal factor in this state of affairs, we do believe that teachers of the type sampled in this study (the majority, in our opinion) are doing little or nothing to relieve an already intolerable situation for certain children."

The solution that he suggested: "Some type of in-service training program for experienced teachers is indicated."

Science News Letter, January 14, 1950

MEDICINE

Chemicals Prolong Lives Of Leukemia Patients

► **LIVES** of some adults with acute leukemia have been prolonged as much as a year by treatment with anti-vitamin chemicals called folic acid antagonists, Dr. Frank H. Bethell, University of Michigan medical professor, reported at a meeting of the American College of Physicians in Indianapolis.

Acute leukemia is usually fatal to grown-ups within three months, he pointed out.

The disease is characterized by an excessive production of white blood cells that are not able to perform their normal function of destroying invading bacteria or disease germs, he explained. The condition is the result of abnormal blood-forming tissue in the bone marrow and lymph glands.

Folic acid, a part of the vitamin B complex needed by all body tissue to perform its normal function, shows encouraging signs of contributing to the control of leukemia, Dr. Bethell said.

By altering the chemical structure of this essential vitamin, compounds are developed which when absorbed by the abnormal white cells prevent them from growing and producing more cells. These compounds, Dr. Bethell said, have also been used with some encouraging signs in the treatment of children with leukemia.

Science News Letter, January 14, 1950

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1950



New and shorter big screen 16-inch kinescope developed by RCA scientists.

*Problem: shrink the television tube, but keep the picture **big!***

Some rooms accommodate grand pianos, a small spinet is right for others. Until *recently*, much the same rule held true for television receivers. Your choice was governed by room space.

Now the space problem has been whipped by RCA scientists, who have *shortened the length of 16-inch television "picture tubes" more than 20%!* All the complex inner works—such as the sensitive electron gun that "paints" pictures on the screen—have been redesigned to operate at shorter focus, wider angle. Even a new type of faceplate glass,

Filterglass, has been developed for RCA's 16-inch picture tubes—on principles first investigated for television by RCA.

Filterglass, incorporating a light-absorbing material, improves picture quality by cutting down reflected room light . . . and by reducing reflections inside the glass faceplate of the kinescope tube itself. Result: richer, deeper black areas and greater contrast in the television picture!

See the newest advances in radio, television, and electronics at RCA Exhibition Hall, 36 W. 49th St., New York. Admission is free. Radio Corporation of America, Radio City, N. Y.



New RCA Victor home television receiver, with big 16-inch screen—now more than 20% shorter in depth.



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Chickens

► THE ancient question, "Why does a chicken cross the road?" with its stock answer, "To get to the other side" betrays a faint annoyance. After all, cats, dogs, cattle, and other beasts have the road-crossing habit too, but no one ever questions their motives. The truth of the matter is simple: the barnyard chicken is a rather silly bird.

But it doesn't matter. We keep chickens for food, not for pets. In some parts of the world chickens are still kept for fighting. Silly or no, chickens were enticed out of the wild into domesticity a long time ago.

Like all of our domestic animals, the chicken started its career in the wild. Its wild prototype originated in the jungles of India under the name of *Gallus Bankiva*. At large in its native habitat, there is nothing of the dumb cluck about the chicken. It is a wily bird, elusive, resourceful, and hard to capture.

But once caught, the chicken proves itself to be one of the animals best adapted to domestication. It has been pointed out that of all the types and kinds of animals there are, only some 50 have been able to adapt themselves to domestication. Apparently the knack of forgetting the wild old days and accepting double harness with man is a rare quality.

The chicken possesses it in a high degree. Even the wild birds, if captured young enough, will readily forego their jungle *laissez-faire* for the security of the barnyard.

It is some measure of the bird's native qualities that man first domesticated the chicken, not for its flesh or its eggs but for its fighting ability. Cockfighting is one of man's earliest recorded entertainments. And man quickly came to value his gamecocks for their ability to tell time. Men have risen at cockcrow for ages; alarm clocks are fairly recent.

Many terms now used in boxing derive from the language of cockfighting. The set-to was when the birds first came together, seeking an opening. The clinch, and taking the count, were used in almost the same sense in which today's boxing writers use them. When many cocks were put into the pit in a free-for-all elimination contest from which one battered rooster was expected to emerge victorious, the ensuing fracas was known as a battle royal.

Very early in the history of the chicken-human association some unsung benefactor of the human race started to keep chickens for food, not merely for sport. For some reason it is usually believed that this development should be credited to women, who frequently are responsible for feeding and tending chickens.

From the jungles of India, chickens passed westward to ancient Greece and Rome, and they rapidly spread all over Europe. Chickens were not found in America, but they were soon introduced.

Science News Letter, January 14, 1950

On This Week's Cover

► SIX television tubes per minute are now coming off conveyorized production lines such as this one in the Ottawa, Ohio, plant of Sylvania Electric Products, Inc., major television tube producer. The tube industry looks forward to a near 5,000,000 unit year in 1950. Both standard and "gray-face" tubes and the new "short" and rectangular-face types, which are expected to reduce the size of television cabinets next year, are now in production.

Science News Letter, January 14, 1950

ASTRONOMY

Calculations Reported on Solomon's Molten Sea

► NEW Yorkers wished that the 10,000 gallons of water contained in the "molten sea" near Solomon's temple might be available to them.

The "molten sea" was actually a large vessel of cast brass, made to order for Solomon. It is described in the Bible in both I Kings and II Corinthians. But the shape and amount of water held vary in the two versions.

Dr. C. C. Wylie, professor of astronomy at the University of Iowa, has calculated that the hemispherical shape and 2000 "baths" mentioned in I Kings are correct. He reported his findings to the astronomers at the American Association for the Advancement of Science meeting.

His calculations assume that the two different capacities mentioned in the Bible were found, not by measuring the amount of water needed to fill the molten sea, but by figuring from the height, diameter and circumference reported for it.

The measurements are given in cubits and the capacities are given in "baths." A cubit is the length from the tip of a man's middle finger to his elbow. There are two cubits, a short one equal to about 17 and a half inches and a royal cubit of about 21 inches, he stated.

Many authorities favor a figure of about 10 gallons for a "bath." A few mention also a smaller figure of about five gallons. Recently actual jars marked "bath" were found in excavations, Dr. Wylie reports. These had a capacity of about five and three-quarters gallons. A few larger jars marked "royal bath" were found that had a capacity of about 10 gallons, thus explaining the two figures.

In another paper Dr. Wylie presented a method of calculating the weight in tons of iron meteorites when their shape is fairly regular. Using his formulas he recalculated the weight of the two largest known meteorites.

He found that the Cape York Meteorite, now in the Hayden Planetarium, weighs 65 tons. This weight differs from the 36 and a half tons adopted for this big meteorite by the American Museum of Natural History about 40 years ago. Dr. Wylie's weight for the Grootfontein meteorite is 67 and a half tons.

The history of the constellations that marked the beginnings of the seasons 3000 to 5000 years ago was also reported by Dr. Wylie. He showed how the figures made by the stars had become the sacred symbols of different countries, including the eagle for the United States. The eagle was once the sign of autumn, after the constellation Aquila the eagle.

Science News Letter, January 14, 1950

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ALBERT EINSTEIN: PHILOSOPHER-SCIENTIST—Paul Arthur Schilpp, Ed.—*Library of Living Philosophers*, Vol. 7, 781 p., illus., \$8.50. No less than 25 leading scholars and scientists discuss various aspects of Einstein's epoch-making scientific work and achievements. Also included is an autobiography.

ARCHEOLOGY OF THE FLORIDA GULF COAST—Gordon R. Willey—*Smithsonian*, 599 p., illus., paper, \$4.00. A monograph reporting results of field trips taken by the author, also a compilation and investigation of previous archeological work.

THE CHEMOTHERAPY OF TUBERCULOSIS—The Experimental Approach—Max B. Lurie and others—*New York Academy of Sciences*, 165 p., illus., paper, \$2.50. This monograph provides a general survey of the experimental work and its results in the treatment of tuberculosis with streptomycin and other chemotherapeutic agents. The series of papers was presented before the Section on Biology of the New York Academy of Sciences, June 24-25, 1949.

EXPLORER OF THE HUMAN BRAIN: The Life of Santiago Ramon y Cajal (1852-1934)—Dorothy F. Cannon—*Schuman*, 303 p., illus., \$4.00. The biography of one of Spain's greatest scientists. Another volume in the *Schuman Life of Science Library*.

FIFTY YEARS OF PLANT PHYSIOLOGY—Th. Weevers—*Chronica Botanica*, 308 p., illus., \$5.00. A textbook placed on a historical basis covering the years 1895-1945.

GROUND-WATER CONDITIONS IN THE SMOKY

PLANT PATHOLOGY

Fungi Have Double Role

▶ THOSE lowly creatures of the plant kingdom, the fungi, were cast in the twin roles of hero and villain, as plant disease experts heard how in one case they help and in the other they hinder the production of commercially useful tree sap.

One type of fungus prolongs gum flow in turpentine-producing pine trees, and a different fungus causes sugar maple trees to go out of production prematurely, the American Association for the Advancement of Science was told at a discussion of the plant diseases which take a huge annual toll of crops of all kinds.

When spores of the one fungus are sprayed on producing pine trees gum flows for a longer period than ordinarily, said Dr. George H. Hepting and Russell B. Clapper of the U. S. Department of Agriculture.

The extra gum eked out in this fashion has the same desirable chemical qualities as gum from untreated trees. Up until now, no commercial application of the method has been worked out.

The sugar maple fungus clears up a long-standing mystery. It is this fungus,

HILL VALLEY IN SALINE, DICKINSON, AND GEARY COUNTIES, KANSAS—Bruce F. Latta—*University of Kansas*, 152 p., illus., paper, 25 cents. A report on the investigation of ground water in the Smoky Hill Valley. The investigation was carried on by the State Geological Survey of Kansas and the United States Geological Survey.

JET AIRCRAFT SIMPLIFIED—Charles Edward Chapel—*Aero*, 160 p., illus., leatherlike cover, \$3.75; flexible cover, \$2.75. Explains in a step-by-step manner the basic principles and practical applications of jet propulsion. Appropriate illustrations.

PHYSIOLOGY OF HEAT REGULATION AND THE SCIENCE OF CLOTHING—L. H. Newburgh, Ed.—*Saunders*, 457 p., illus., \$7.50. A description of man's heat regulatory responses to climatic conditions the world over and how scientifically designed protective coverings aid in these responses. This study was carried out by the Division of Medical Sciences of the National Research Council.

PROBLEMS OF ECONOMIC RECONSTRUCTION IN THE FAR EAST—Tenth Conference of the Institute of Pacific Relations—*Institute of Pacific Relations*, 125 p., paper, \$1.35. A report considering economic and social re-building in the Far East. The conference was held at Stratford-on-Avon, England, Sept. 5-20, 1947.

UNITED STATES COIN BOOK—Jacques Del Monte—*Fell*, 121 p., illus., \$1.50. A guide to the coins minted by the United States with data showing current market values.

Science News Letter, January 14, 1950

Nestor E. Caroselli of the Bartlett Tree Research Laboratory, Stamford, Conn., has produced a medicated compound which suppresses Dutch elm disease.

The new chemical, which contains derivatives of urea, salicylates, and azo dyes, was developed after over 400 other compounds were tested.

When the soil around the infected tree is impregnated with the solution, the three plant pathologists found that they were able to control the disease in 70% of the trees tested under greenhouse and experimental conditions. On large estate trees, control was only 50%.

Science News Letter, January 14, 1950

MICROBIOLOGY

Microbiologists of Industry Form Society

▶ SWARMING microorganisms have a new scientific society to study them. It is the Society of Industrial Microbiologists, formed during the recent science meetings in New York.

The new group will pay special attention to microscopic life that destroys clothing, building materials and other substances. The organisms that produce the antibiotics, such as penicillin, yeasts that yield alcohol in beer and liquor, and bacteria that produce useful chemicals are in the field of the society.

Dr. Charles Thom of Jeffersonville, N. Y., is the first president.

Science News Letter, January 14, 1950

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❁ **MULTIBLADED SAFETY RAZOR**, recently patented, holds three blades at one time with the shaving edges positioned behind the next, making it possible to get a close smooth shave with but a single pass over the skin. Blades can be removed easily for cleaning or replacement.

Science News Letter, January 14, 1950

❁ **COLOR-CONDITIONER**, to use in the wash instead of bluing, is usable with all washable white or colored fabrics and is said to eliminate entirely the normal yellowish color of washable cloth. It is not a bleach; it adds a visible fluorescent brilliance.

Science News Letter, January 14, 1950

❁ **PORTABLE WATER BATH** for laboratory use has a special bottle-feed device which prevents the bath from boiling dry for as long as ten hours on low heat and five hours on high heat. The bath has two immersion-type heaters, either or both of which can be used.

Science News Letter, January 14, 1950

❁ **SHAMPOO SHADE**, shown in the picture, is a plastic brim made in various



colors with an elastic band that stretches to fit all children's head sizes. It keeps soap

and water out of the youngster's eyes, ears and mouth, thus easing the shampoo job.

Science News Letter, January 14, 1950

❁ **NEW-TYPE DOOR**, for use with rooms in which objects are sprayed with paint or other finish, is similar to conventional garage overhead doors but has rows of furnace-type, spun-glass filters in each panel. Escaping air is filtered on the way out.

Science News Letter, January 14, 1950

❁ **POCKET SACHET**, made of sterilized cotton in a white satin covering, may be used with favorite perfumes and is claimed to make no stains and to hold odors longer than the ordinary type. It is made with a flap so that it can be pinned to pocketless clothing.

Science News Letter, January 14, 1950

❁ **SET SCREW**, a self-locking type that requires no lock nut or other device to make it hold in excessive vibrations, has standard thread on the part that enters the wood first and thread of a larger pitch diameter on its outer one-third. This results in a tension or opposed-force action.

Science News Letter, January 14, 1950

Do You Know?

Great Britain has 11 times as many people per square mile as the United States.

Ceramels, sometimes called cermets, are ceramic-metal combinations used in materials designed to withstand extremely high temperatures such as those in jet engines.

The most disastrous fire year in United States and Canadian history was 1948; of 268 major fires, those having losses of \$250,000 or more, 92 were in manufacturing plants.

Alberta, Canada, is a promising province for chemical production; it has petroleum, natural gas, tar sands, coal, salt, timber and a considerable number of water-power sites suitable for hydroelectric development.

Allyl starch is a new resin, an American product now in the pilot plant stage of production, which promises to have many applications, including the replacement of shellac and as a protective coating for industrial equipment.

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